Sal Noeldner
ISA Certified Arborist-TRAQ
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**Site**

1041 NE 100th Street
Seattle, WA 98125

**Site Characteristics**

Residential neighborhood of closely set residences (houses), many divided by low fences, with the largest trees (gaining at least 100' in height) numbering one to three individuals per residential block on average. Some smaller size trees dot the block, with most being ornamental or useful landscape additions rather than native species or part of a wildlife habitat. Client's residential lot is bordered by a hill requiring a flight of steps on the N side, an alley on the S side, fences on all 4 sides, with neighboring houses (within range of the tree) to the E (2) and W (1). On the E side, to the NE is a house in close proximity to a dividing fence line. Beyond it, the next lot to the E has a house within range of a larger failed tree part as well. The subject tree, a planted (sometime since 1933 according to a vintage picture client provided) Coastal Redwood, has grown up in close proximity to client's house on the north, sidewalk/foundation/covered stairs to the E, and a concrete slab/shed/garage structure on the S end of client's lot. Limbs from the tree grow over all three improvements to the lot. Buckling of concrete slab on N end of shed has occurred over the course of years causing destruction to a portion of it and raising portions of it to 'peaks' where there should be flatness. Buckling to sidewalk is less severe. Mortared stone walkway on N side of tree still in relatively good shape. Foundations of house, shed and stairs under tree dripline. Up to a foot of accumulated needle duff within a landscaping island (which also holds an unknown amount of fill covering lowest portion of stem) and a couple of discarded limbs 2-3" in diameter lie under the tree. Prevailing wind is from the S and SE.

**Summary of Subject Tree Characteristics**

Subject tree is a *Sequoia sempervirens* (Coastal Redwood) which, although it sports a whopping girth of 7'6" **DSH** (This Arborist prefers using **d**iameter **s**tandard **h**eight {4.5'} vs. "dbh" which assumes everyone is the same height or even measures 'breast' from the same portion of the chest column.), the subject tree is only 115' tall and less than 100 yrs. of age. The central stem is only 15' high when it transforms into 3 divided stems (on W, NE, and SE sides of tree) which all divide somehow (bifurcation or spike) once again near 25', with the tallest 3 showing evidence of topping (either man or natural), all @ 100'. One of these shows an obvious recent loss of half of the divided 15' high top, but I didn't see evidence of where it hit (client didn't know). Under the 3 lowest stem joins (on NW, E, S sides of tree), dark furrows in the bark run down to/near ground level. Join to E has a significant bulge underneath. Smooth bark furrows to S of bulge on main stem (same height) show long raccoon use of tree. Join to NW has abnormal bark texture running down from it in an angle downwards to the ground. Where it goes underground, a strip of bark 4" wide and between 2-3' high (depending if/how much duff is measured) has sprung up and outwards in the shape of a knee pointing outwards. I pulled back the needle litter and didn't see the buttress of the tree OR the end of the abnormality. An area of bark between 2-3' high (depending if/how much duff is measured) has sprung up and feels rigid. An additional

protruding area of bark just above it concurs in denoting movement of that portion of the stem rather than the sprung bark being an effect of possible trenching (none seen from cursory examination after pulling back needle duff) from surface-run water lines (to a swimming pool now removed from SW corner of lot). The same orientation to the tree shows a coated cable going up and along the northern most stem to a probable antenna.

**Analysis and Discussion**

I was brought in to look at this tree after the previous owner died and a relative took over as the responsible party for the house. By the state of things, management of the landscaping of the lot was not one of the previous owner's priorities. The current client was worried about portions of the obviously heavy tree falling and hitting his house or houses to either side, and was also upset about the severe buckling being caused to the concrete (slab, sidewalk) around the base of the tree (per our phone conversation). After our thorough inspection one rainy morning, and finding the bark buckling, additional bifurcations/divisions of trunk at 23-25' on all three stems, and a newer loss of partial top (seen at top from the SW alleyway), the client has expressed additional safety concerns about using the current vacant structure now his responsibility to deal with, as well as for the neighboring houses.

At first, with mist in the air, the tree looked healthy with a dense canopy coverage of 40-45' in diameter continuing to 65' in height where it gradually tapers towards the top. However, gaining the bottom of the tree through the alleyway, after the surprise of the large girth of the tree had passed, I immediately saw numerous large stems originating from multiple, but similar, heights denoting **multiple prior topping episodes**. All joins were acutely angled except one I saw, from the SW alleyway, where one half of one stem had failed, leaving the other half, which has an obviously curved (stronger) join. Looking down, only one root of any girth can be seen, it being a significant buttressing root traveling SW less than 10' before diving underground. Just to the N of it on the lowest portion of the main stem, a protruding bark strip drew my attention. At first I assumed it was cut at the base due to water lines being run, but upon further investigation (kicking, firm tugging) I found it to be solid in some way even though it sprung with an obtuse angle facing its origin. A different, more obviously natural defect is just above this one and shows a less but still significant bark buckling, seen both by protrusion and by changing bark textures. A coated cable of some type was seen running up the northern most stem of the NE stem group. This could possibly explain the similar reduction of the three highest tops @ 100', rather than assuming all three failed at similar heights less than ten years ago (I bet an antenna of some variety is lodged in the topmost canopy.). Checking around for more of this type of significant bark defects, I did not see any but did see a significant (2'x3' ovoid) bulge under the E join. The darker furrow running down from the above join, with the significant bulge underneath denotes an area of interest/decay in the heartwood. All three joins have darkened furrows of bark underneath which shows passage of precipitation and/or signify a cavity(ies) in the middle of the tree oozing moisture. Just to the S of the major bulge on the stem is evidence of long use by raccoons signifying an increased debris load (raccoons have normal 'latrines' they use) in the crotches of the tree. The observed evidence of stem (bark) movement on the lowest W stem is a decisive element when compounded with the tendency of this tree to break when rotted, the significant bulge denoting rot under the E join, the wind directions/force, the limited root

space on one side of the tree, and the increased organic debris load on many acute angle joins (These hold debris and also usually have large amounts of included bark; are considered a 'weak' tree structure because of rotting and wood grain design.). This tree holds a significant mass of multiple weakened tree parts over many targets. The question is not 'if' (as we see by the observed lost portion of W stem group top and movement of lower portion of NW stem) but 'when' a failure will occur AND if the probable failure will be of a larger or smaller portion of one stem or of the entire tree. This exotic tree makes the exuberant growth of our native trees (except possibly Black Cottonwood) pale in comparison. Coastal Redwoods can gain 400'+ (not that I think any of the tops would make it that high because of significant stem defects), grow significantly faster than our local conifers, and because of this species' usual dense canopy being tripled in this particular specimen, the ambient limb profusion acts as an excellent wind sail. The strongest root seen helps prop and feed the SW portion of the tree. The SE stem group acts as a partial wind block for both the W and NE stem groups, but only from one of the two prevailing wind directions (S/SE). The second house to the E is partially shielded by a medium sized planted tree, and is between a 1-1 ½ times tree height fall radius (used because of projectile effect of falling tree part) making it a possible target in case of full SE stem failure. House to W, client's house, and house directly to E are within the a 1x-height fall radius. Wind is strongest from the S and SE because although the tree is near the top of a hill, a larger number of taller trees in the SW direction will act as a partial reducer of wind force. Any movement in the lower stem (bark protrusions) is not a good sign and shows a portion of the tree is moving from either wind or gravity stresses. The buttressing root to SW makes full failure of the W stem less of a hazard (to the house towards the W) but an increased chance of failure (assumed rot columns begun both at top and bottom of W stem group from observed loss of half of a top with a strong, curved join {vs. acute} and observed evidence of partial lower stem movement from bark movement) of the weak join of the spike limb at 25' (showing discoloration), causing a large-sized tree part to fail within 3 years and strike the house to the W (due to prevailing wind direction) causing severe consequences, gives this tree its' first 'High' risk rating. The probably partially rotten NE stem group with little root buttressing/strength (due to limited root volume) also poses a 'High' risk to multiple houses. **It is likely that a strong wind from the SE will cause all or a portion of the NE stem group to fail and produce severe damage to one of two houses within a 3 year time span.** Also, because of an unseen degree of rot and limited root space, all or any individuals of the three major stem groups can possibly fail due to wind force compounding an unknown extent of probable internal heart rot decay.

Just as true firs should be considered landscape elements only and never be assumed to reach senescence at this meager altitude because of increased heat/drought, this tree is truly exotic and out of place in an urban, residential environment. That said, if this tree was a single stemmed specimen with similar girth, I may argue that the city should acquire the surrounding lots and make a park out of it to allow citizens to see a natural wonder of the coastal forests of Oregon and California.

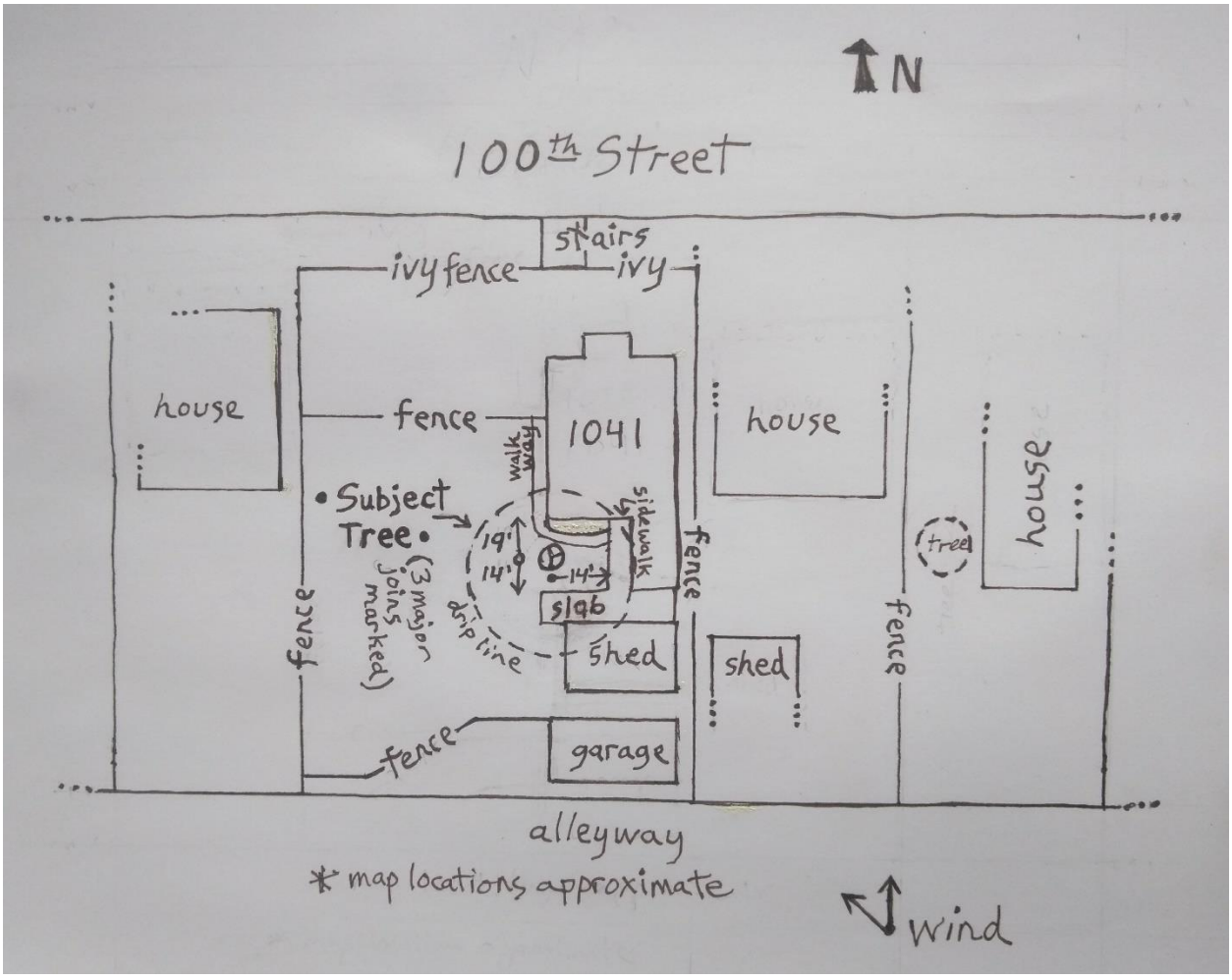
**Recommendations**

**I recommend removal of the subject tree due to above mentioned defects causing it to rate a 'High' risk to surrounding houses with no chance of mitigation.** As this is a planted landscape element grown elephantine and hazardous, removal efforts will not be easy. Homeowner should assume large scale disruption of the backyard. Tree removal will certainly take a number of days and be costly. Grinding of the stump may take a number of days depending on how many rocks are found. Tree service personnel are cautioned this is currently an EXTREMELY HAZARDOUS tree to remove due to many metal elements driven/screwed into the lower stem, as well as holding the antenna/cable in place. A metal detector needs to be used for effect to lessen the hazard.

1-19-20

(see following pages for site map and photos)

**Site Map**




Showing house in 1933 with no Coastal Redwood in evidence.

Showing full tree from SW alleyway. Notice extra dense, fairly even diameter canopy to 65', also missing 15' of the right top.

Closeup of top showing hole in canopy.

Showing degree of lift of concrete slab to S of subject tree.

View of concrete slab with lifted ‘peak’ of concrete removed by previous owner.

View of stem looking N. Notice 2 bark furrows under S join discolored, with slight bulge between.

View of ENE join with significant bulge denoting rot underneath.

View of NW join showing cable running up center left and dark colored furrow running to dark colored sprung bark strip.

Showing bark strip sprung from tree (lower right in front of water line) and above bark deformation looking S.

Showing bark strip sprung out and above to right bark deformation looking N.

Closeup of join to S showing acuteness, included bark, and debris holding capacity of one of the three lower main joins. Remember the confluence of the joins which will hold the most debris.

Looking up showing dense canopy and 5 percent dead limbs.

Looking N from sidewalk.

Showing only visible buttressing root traveling SW, also possible degree of fill within landscaping island.

Showing two fallen limbs to 2 ½ “ dia. (one partially buried behind hose) and amount of needle little (some recently moved from mortared stone walkway), looking NE.

Showing foliage pattern.